My invention relates to a cement finishing device. An object of my invention is to provide an arrangement for finishing off concrete on bridges, highways, or other locations.

A further object of my invention is to provide an arrangement which operates automatically, and smoothly finishes off the concrete, and with the required slope on the concrete.

A further object of my invention is to provide a supporting structure which can be adjustably narrowed or widened consistent with the width of the roadway, and with further means for adjusting the angle of the device.

A further object of my invention is to provide adjustable arrangements wherein the truss structure can be rigidly adjusted to the required angle.

A further object of my invention is to provide an arrangement which provides a positive strike-off of the concrete.

A further object of my invention is to provide certain bull float arrangements for uniformly finishing off the concrete.

A further object of my invention is to provide a special drive arrangement for simultaneously providing the bull float drive and the reciprocating movement of the bull float carriage.

A further object of my invention is to provide a special easily usable unit including the following members:

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

FIGURE 1 is a cross section of a roadway or bridge showing the operation of the apparatus on the same.

FIGURE 2 is an enlarged plan view of a portion of the bull float device.

FIGURE 3 is a transverse sectional view of the truss work showing the reciprocating bull float member.

FIGURE 4 is an enlarged detail of the side adjusting arrangements.

FIGURE 5 is a plan view of my special drive arrangement.

FIGURE 6 is an elevation of a portion of FIGURE 5.

FIGURE 7 is an enlarged detail of one of the slope adjusting members.

FIGURE 8 is a plan view of an end portion of the bull float member.

FIGURE 9 is a side elevation of a modification of FIGURE 8.

FIG. 10 is a plan view of FIGURE 9.

FIGURE 11 is a side elevation of a modified form of the bull float.

FIGURE 12 is a plan view of FIGURE 11.

FIGURE 13 is a plan view of a modification, FIGURE 14 is a side view of FIGURE 13, with fragmentary sections, and FIGURE 15 is a further side view of FIGURE 13.

My invention contemplates the provision of a strike-off and cement finishing arrangement which can be mounted transversely on a roadway, bridge, etc., and wherein the device will be suitably powered and driven to smooth the concrete thereon and to provide further advantages as will be apparent.

In describing my invention I have used the character 10 to designate square-in-section tubular members to which are attached at 11 the further similar members 12, the characters 13 and 14 indicating bracing members, the members 10 being hinged together at 15, and attached to the members 13 are the straps 16 through which straps pass the threaded studs 17 engaged by the nuts 18, this structure providing means for setting the pitch as desired to the members 10.

The characters 19 and 20 (see FIGURE 3) indicate further bracing rods, and attached at 21 (see FIGURES 3 and 7) to the members 10 are the vertically positioned posts 22 to which are attached the straps 23, the character 24 indicating a series of spaced threaded studs threadably engaged with the members or lugs 25 which lugs slidably receive the posts 22, the character 26 indicating collars, and the character 27 indicates the heads or the studs or bolts 24. Attached at 28 to the lugs 25 are the channel members 29 having the vertical ribs 30, and engaging the ribs 30 are the various grooved wheels 31 (see FIGURE 3) which are attached to the plates 32 which are attached to the plates 33 to which are attached the further shafts 34 upon which shafts 34 are journaled the wheels 35, the wheels 35 engaging the channel members 29 as shown in FIGURE 3.

Pivotal attached at 36 to the members 33 are the male square members 37 which are received within the female square tubes 38, the character 39 indicating set screw members for tightly engaging the members 37 and 38 at selected positions.

Engaging the upper and lower edges 40 of the members 38 are the grooved wheels 41 suitably secured to the supports 42, and attached across the members 38 are the bracket supports 43 having a platform portion 44 upon which is mounted an electric or other motor 45 which drives the belt 46 which in turn drives the pulley 47 and a suitable gear arrangement within the housing 48, this gear arrangement being adapted to drive the shaft 49 having the eccentric portion 50 which portion 50 is pivotally attached at 51 to a rod 52 which is pivotally attached at 53 to the brace 54 attached between the vertical supports 42, the character 53a indicating further braces, the character 54a indicating a lengthened strap attached at 55 to the members 56 which are secured to the bull float member indicated generally by the character 57 and which can be of a substantially hollow construction to which is attached at 58 the member 59 having the successive reduced portions 60, 61, and 62, and journaled in these portions as at 63 are the shafts 64 to which are attached the drum shaped rotatable members 65 to which are attached the peripheral arranged rods 66.

A further bull float construction which can be used alternately with the construction shown in FIGURE 8 is that shown in FIGURE 9 wherein a platform 67 to which is attached a small motor 68 is used the platform being suitably attached to the member 62, the motor 68 driving a pulley 69 which drives a forward shaft 70 upon which is mounted a further roller 71 substantially similar to the members 65.

A further modification of the bull float member is shown in FIGURES 11 and 12 with identical characters.
indicating identical parts and in this structure the character 72 indicates a series of spaced plates attached between the walls 73 and 74 etc., the character 75 indicating bracing members. The character 75a indicates plates which can be inserted between the members 73 and 74 (see FIGURE 11) which will be used when the members 65 are removed.

Attached across the members 12 (see FIGURE 1) is a motor 76 which is adapted to drive a reduction gearing at 77 which in turn drives a sprocket 78 which engages the endless sprocket chain 79 which passes over suitable pulleys at 80, the sprocket chain 79 being attached at 80a (see FIGURES 2 and 3) to the members 38.

Further framework members which are attached to the ends of the truss-like structure above described include the upper and lower bars 81 and 82 connected to the vertical straps 83, certain of the straps 83 being pivotally mounted at 84 to substantially similar straps or supports such as 85 and attached across the various supports 85 are the upper and lower rails 86 and 87, and engaging the rails 86 and 87 are the small grooved wheels 88 and 89 (see FIGURE 4) which are secured to the blocks 90 and 91 to which are clamped at 92 the vertically positioned tubes 93, and threadably engaged within the tubes 93 are the lengthwise inner rods 94 which when handles 95, the character 96 indicating a clamp adapted to secure the inner member 94 in adjusted position, and attached at 97 to the bottom of the members 94 are the U-shaped members 98 in which are journalled the grooved wheels 99 which are adapted to travel along the screw pipe 100 which are secured to the braces 101 attached as at 102 to suitable supports adjacent to the concrete.

The character 103 indicates studs and washers attached to the various members 85, the studs passing through slots in the members 83 to provide for swinging movement of the framework members 81, 82 etc., for adjustment.

The character 104 indicates vertically positioned straps attached to the members 12, the character 105 indicating lengthened threaded studs threadably engaged at 106 and bearing at 107 on the members 81 to secure the frameworks 81, 82, etc. In selected position, the character 108 indicating further straps attached across the members 81 and 82, and having the slots 109 therein through which pass the studs 110 with suitable bolts attached thereto for additional securing means.

It will be noted from the foregoing structure that the sprocket chain 79 when operating will carry the framework 11 in either the direction 111 or 112 (see FIGURE 1). The bull-floating members can be angularly positioned as desired by means of adjusting the set screws 39 and relocating them, and it will be noted particularly that the eccentric member 50 will provide means whereby the bull-floating member will reciprocate back and forth in the direction of the arrows 113 (see FIGURE 3) as the bull-floating travels in direction of the arrows 111 or 112. In other words the bull-floating will reciprocate in a direction parallel to the longitudinal axis of the roadway which is indicated by the character 114.

By moving the members 93 in either direction 115 or 116 the wheels 99 can be set at any pre-selected position laterally to thereby accommodate wider or narrow roadways and the like, since the rollers 88 and 89 can be rolled along the tracks 86 and 87 to pre-selected position.

If desired a connecting arrangement can be provided at 117 (see FIGURE 4) for engaging a suitable motor.

It will be noted that due to the horizontal positioning of frameworks 81, 82, etc., the members 93 will be maintained in vertical positions at all times so that the rollers 99 will not converge downwardly, and it will be further noted that this structure 81, 82, etc., can be slightly angularly positioned in order to compensate for any difference in angle of the roadways etc.

The adjusting members shown in FIGURE 7 can be used to adjust the tracks 29 to the desired pitch of the roadway by merely rotating the heads 27, and which will additionally secure the pitch at either side.

The character 118 will rotate freely, and will serve to even the cement, and the successive reduced portions 60, 61, and 62 also tend to even out the cement during each forward or rearward thrust of the bull-floating member, the modification shown in FIGURES 9 and 10 also showing a similar purpose as well as the modification shown in FIGURES 11 and 12 extending inwardly to a radius within the inner ring as best shown in FIGURES 13 and 14.

Attached across the ring 135 are the square tubes 138 having the upper edges 139 which engage the rollers 140 and 141, these rollers being adapted to reciprocate or roll rearwardly and forwardly along the edges 139 to provide for the reciprocating movement of the lower screwed portion, it being noted that in this arrangement the ring shaped members are used instead of the structure used in FIGURES 1, 2, 3 etc.

The character 142 indicates transverse braces, the character 143 indicating a platform suspended therefrom upon which is mounted the motor 144 and other members 145 etc. adapted to drive the crank arm 146 which in turn operates the screw similar to the unit described above, the character 147 indicating further supporting braces and the like to which the rollers 140 and 141 are attached. The lower screwed portions are substantially the same as that described above with the exception that mounted above the member 57 are the brackets 148 to which are pivoted at 149 the arms 150 for the portions 151 to which are secured at 152 the trawling members 153.

Pivoted at 154 to the outer stationary ring 136 are the cam members 155 having the cam portions 156, and pivoted to the cam members 155 are the links 158 which are pivoted at 159 to the levers 160 pivoted at 161.
the levers 160 carrying the adjustable set screw clamps 162 which are normally adapted to bear against the flange 137.

The framework portion 163 is attached to the stationary ring 136 and includes the bearings 164 in which are slidably received the lengthened rods 165 having the abutment ends 166. Attached to the rods 165 are the ears 167 having the slots 168 engaging the pins 169 which pins are attached to the cams 155.

The character 170 indicates further bracing members, and the character 171 indicates clamping units for preventing relative rotation between the rings 136 and 135.

This latter described arrangement is used in the following manner. Whenever it is desired to use the troweling elements 153 only, without the other lower screen portions, any type of abutment member is attached to any of the stationary framework portions 10 or the like, and in a position so that they will be contacted by the members 166. For instance, assuming that the unit is traveling in the direction of the arrow 172 (see FIGURE 15), when the abutment members 166 abut against the fixed abutment members, the tendency will be to force the rods 165 in the direction of the arrow 173 which will cause the cam 155 to rotate in the direction of the arrow 174 which will cause the cam surface 156 to raise the flange surface 137 which will then completely raise the entire reciprocating screed structure, and so that the troweling members 153 will thereby operate independently of the screed lower portions, and the troweling can then be accomplished when the unit trowels in a reverse direction with either one of the troweling units 153 being used or both, as desired, and as soon as the abutment members 166 at the other sides of the rods 165 strike further fixed abutment members at the other side of the truss, the rods will then move in the direction of the arrow 175 which brings the cams 155 to the solid line position again so that the screed surfaces will be lowered and can be used in the usual manner, and in this way the unit can be selectively used for either purpose.

The dotted lines in FIGURE 15 show the screed member 57 when in its normal position and before the cam 155 was rotated to raise the unit, the solid lines showing the unit in the raised position.

It will be noted that the rods 158 will also pivot to swing the levers 160 and raise the attached devices 162 at the same time that the cams operate.

The rings 135 and 136 also permit an arrangement whereby the various screed members can be positioned at any angle desired, by merely rotating the ring 135 with respect to the ring 136.

It will now be noted that I have provided the advantages mentioned in the objects of my invention, with further advantages being apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. A concrete finishing machine comprising a laterally positioned truss work, carriage means movably mounted on said truss work, a first ring fixed to said carriage means, a second ring slidably and rotatably mounted inside said first ring, adjustment means engaged between said first and second rings to hold said rings in an adjusted vertical position relative to each other, and a lower cement surfacing unit attached to said second ring whereby said surfacing unit can be adjusted vertically and rotationally with respect to said truss work.

2. The device of claim 1 in which said adjustment means engaged between the first and second rings include cam members mounted on said first ring and bearing against said second ring, abutment means operably connected to said cam members to operate said cams upon engagement with said truss work.

3. The device of claim 1 in which said surfacing unit includes float means, troweling unit pivotally mounted to said float means and substantially parallel thereto, said troweling means being thereby adapted to remain in contact with said concrete when said float member is raised with said second ring.

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